

CLAIMS

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1. A method comprising:
receiving an original digital good; and
randomly applying various forms of protection to the original digital good
to produce a protected digital good.

2. A method as recited in claim 1, wherein the randomly applying
comprises pseudo randomly applying the various forms of protection according to
pseudo random techniques.

3. A method as recited in claim 1, wherein the applying comprises
randomly selecting the forms of protection from a set of available forms of
protection.

4. A method as recited in claim 1, wherein the applying comprises
applying the various forms of protection to randomly selected portions of the
original digital good.

1 5. A method as recited in claim 1, wherein the various forms of
2 protection are selected from a group of protection tools comprising code integrity
3 verification, acyclic code integrity verification, cyclic code integrity verification,
4 secret key scattering, obfuscated function execution, encryption/decryption,
5 probabilistic checking, Boolean check obfuscation, in-lining, reseeding pseudo
6 random number generators with time varying inputs, anti-disassembly methods,
7 varying execution paths between runs, anti-debugging methods, and time/space
8 separation between tamper detection and response.

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10 6. A method as recited in claim 1, wherein the applying comprises
11 applying a form of protection in which a checksum can be computed on a set of
12 bytes of the digital good without actually reading the bytes.

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14 7. A computer-readable medium comprising computer-readable
15 instructions that, when executed by a processor, direct a computer system to
16 perform the method as recited in claim 1.

17
18 8. A method comprising:
19 segmenting a digital good into a plurality of segments;
20 selecting multiple segments from the plurality of segments; and
21 transforming the selected segments according to different protection
22 techniques to produce a protected digital good having a composite of variously
23 protected segments.

1 9. A method as recited in claim 8, wherein at least two of the segments
2 overlap one another.

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4 10. A method as recited in claim 8, wherein the selecting comprises
5 randomly selecting the segments.

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7 11. A method as recited in claim 8, wherein the transforming comprises
8 transforming the selected segments according to randomly chosen protection
9 techniques.

10
11 12. A method as recited in claim 8, wherein the transforming comprises:
12 augmenting at least one segment using a certain protection technique; and
13 inserting a checkpoint, which may be used to evaluate a validity of the
14 augmented segment, within the protected digital good but outside of the
15 augmented segment being evaluated.

16
17 13. A method as recited in claim 8, further comprising receiving
18 quantitative parameters indicative of how much the protected digital good should
19 be altered.

20
21 14. A method as recited in claim 13, wherein the transforming is
22 performed to satisfy the quantitative parameters.

1 **15.** A method as recited in claim 8, wherein the protection techniques
2 are selected from a group of protection tools comprising code integrity
3 verification, acyclic code integrity verification, cyclic code integrity verification,
4 secret key scattering, obfuscated function execution, encryption/decryption,
5 probabilistic checking, Boolean check obfuscation, in-lining, reseeding pseudo
6 random number generators with time varying inputs, anti-disassembly methods,
7 varying execution paths between runs, anti-debugging methods, and time/space
8 separation between tamper detection and response.

9
10 **16.** A method as recited in claim 8, wherein the transforming comprises
11 applying a protection technique in which a checksum can be computed on a set of
12 bytes of the digital good without actually reading the bytes.

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14 **17.** A computer-readable medium comprising computer-readable
15 instructions that, when executed by a processor, direct a computer system to
16 perform the method as recited in claim 8.

17
18 **18.** A method comprising:
19 establishing parameters prescribing a desired quantity of protection to be
20 applied to a software product;
21 parsing the software product into code sections;
22 selecting at least one code section;
23 augmenting the selected code section to add protection qualities; and
24 repeating the selecting and the augmenting for different code sections until
25 the desired quantity of protection has been applied.

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2 **19.** A method as recited in claim 18, wherein the establishing comprises
3 enabling a user to enter the parameters.

4
5 **20.** A method as recited in claim 18, wherein the augmenting comprises
6 applying a protection technique selected from a group of protection techniques
7 comprising code integrity verification, acyclic code integrity verification, cyclic
8 code integrity verification, secret key scattering, obfuscated function execution,
9 encryption/decryption, probabilistic checking, Boolean check obfuscation, in-
10 lining, reseeding pseudo random number generators with time varying inputs, anti-
11 disassembly methods, varying execution paths between runs, anti-debugging
12 methods, and time/space separation between tamper detection and response.

13
14 **21.** A method as recited in claim 18, wherein the augmenting comprises
15 applying a protection technique in which a checksum can be computed on a set of
16 bytes of the digital good without actually reading the bytes.

17
18 **22.** A computer-readable medium comprising computer-readable
19 instructions that, when executed by a processor, direct a computer system to
20 perform the method as recited in claim 18.

21
22 **23.** A production system, comprising:
23 a memory to store an original digital good; and
24 a production server equipped with a set of multiple protection tools that
25 may be used to augment the original digital good for protection purposes, the

1 production server being configured to parse the original digital good and apply
2 protection tools selected from the set of protection tools to various portions of the
3 original digital good in a random manner to produce a protected digital good
4 having a composite of variously protected portions.
5

6 **24.** A production system as recited in claim 23, wherein the protection
7 tools are selected from a group of protection tools comprising code integrity
8 verification, acyclic code integrity verification, cyclic code integrity verification,
9 secret key scattering, obfuscated function execution, encryption/decryption,
10 probabilistic checking, Boolean check obfuscation, in-lining, reseeding pseudo
11 random number generators with time varying inputs, anti-disassembly methods,
12 varying execution paths between runs, anti-debugging methods, and time/space
13 separation between tamper detection and response.
14

15 **25.** A production system as recited in claim 23, wherein the production
16 server applies a protection tool that enables a checksum to be computed on a set of
17 bytes of the digital good without actually reading the bytes.
18

19 **26.** A production system as recited in claim 23, wherein the production
20 server has a pseudo random generator to introduce randomness into the application
21 of the protection tools to various portions of the original digital good.
22

23 **27.** An obfuscation system, comprising:
24 a parser to parse a digital good into a plurality of segments;
25

1 a set of protection tools that may be applied to the segments of the digital
2 good to augment the segments with protection qualities;

3 a target segment selector to select at least one segment from the plurality of
4 segments; and

5 a tool selector to select at least one protection tool from the set of protection
6 tools and apply the selected protection tool to the selected segment.

7
8 **28.** An obfuscation system as recited in claim 27, wherein the protection
9 tools are selected from a group of protection tools comprising code integrity
10 verification, acyclic code integrity verification, cyclic code integrity verification,
11 secret key scattering, obfuscated function execution, encryption/decryption,
12 probabilistic checking, Boolean check obfuscation, in-lining, reseeding pseudo
13 random number generators with time varying inputs, anti-disassembly methods,
14 varying execution paths between runs, anti-debugging methods, and time/space
15 separation between tamper detection and response.

16
17 **29.** An obfuscation system as recited in claim 27, wherein the target
18 segment selector comprises a pseudo random generator to enable random selection
19 of the segment.

20
21 **30.** An obfuscation system as recited in claim 27, wherein the tool
22 selector comprises a pseudo random generator to enable random selection of the
23 protection tool.
24
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1 **31.** An obfuscation system as recited in claim 27, further comprising a
2 quantitative unit to specify a quantity of protection qualities to be added to the
3 digital good.

4
5 **32.** A client-server system, comprising:
6 a production server to randomly apply various forms of protection to a
7 digital good to produce a protected digital good; and
8 a client to store and execute the protected digital good, the client being
9 configured to evaluate the protected digital good to determine whether the
10 protected digital good has been tampered with.

11
12 **33.** One or more computer-readable media having computer-executable
13 instructions that, when executed, direct a computing device to:
14 parse a digital good into a plurality of segments; and
15 apply multiple different protection tools to various segments in a random
16 manner to produce a protected digital good having a composite of variously
17 protected portions.

18
19 **34.** One or more computer-readable media as recited in claim 33, further
20 comprising computer-executable instructions to randomly select the protection
21 tools from a set of available protection tools.

1 35. One or more computer-readable media as recited in claim 33,
2 further comprising computer-executable instructions to apply the protection tools
3 to randomly selected portions of the original digital good.

4
5 36. One or more computer-readable media as recited in claim 33,
6 wherein the protection tools are selected from a group of protection tools
7 comprising code integrity verification, acyclic code integrity verification, cyclic
8 code integrity verification, secret key scattering, obfuscated function execution,
9 encryption/decryption, probabilistic checking, Boolean check obfuscation, in-
10 lining, reseeding pseudo random number generators with time varying inputs, anti-
11 disassembly methods, varying execution paths between runs, anti-debugging
12 methods, and time/space separation between tamper detection and response.